What is claimed is:

1. A jet fuel additive concentrate composition, comprising:

(A) a solvent suitable for use in a jet fuel;

(B) a composition selected from the group consisting of (1) a reaction product of a hydrocarbyl-substituted succinic acylating agent and a mixture of a polyamine and a polyhydric alcohol or an acid catalyzed condensation product of a polyamine and a polyhydroxy-containing compound wherein the hydrocarbyl substituent of (B)(1) has a number average molecular weight of 600 to 3,000; (2) a polyalkenylthiophosphonate ester wherein the polyalkenyl substituent of (B)(2) has a number average molecular weight of 300 to 5,000; and (4) mixtures thereof; and

(C) a composition selected from the group consisting of (5) a metal salt of an oligomeric reaction product of a hydrocarbyl-substituted phenol and an aldehyde; (6) an oligomeric reaction product of a hydrocarbyl-substituted phenol, an aldehyde, and a carboxyl-substituted phenol; and (7) mixtures thereof wherein the solvent is present in the concentrate composition at 20-80 weight %, and each of the compositions for components (B) and (C) is present in the concentrate composition at 1-70 weight %.

2. The concentrate composition of claim 1 wherein the solvent comprises xylenes, paraffinic naphtha, aromatic naphtha, or mixtures thereof.

3. The concentrate composition of claim 1 wherein the hydrocarbyl substituent of the acylating agent of (B)(1) is derived from a polyisobutene having a number average molecular weight of 700 to 1500.

4. The concentrate composition of claim 1 wherein the polyamine of the mixture of (B)(1) is a polyethylenepolyamine and the polyethylenepolyamine is introduced into the reaction after the polyhydric alcohol.

5. The concentrate composition of claim 1 wherein the acid catalyzed condensation product of (B)(1) is prepared from the reaction of polyethylenepolyamine bottoms and tris(hydroxymethyl)aminomethane.

6. The concentrate composition of claim 1 wherein the polyalkenylthiophosphonate ester of (B)(2) is a pentaerythritol ester of a polyisobutenylthiophosphonic acid.

7. The concentrate composition of claim 1 wherein the metal salt of the oligomeric reaction product of (C)(5) is the reaction product of an alkylphenol, formaldehyde, and an inorganic alkaline earth metal base wherein the alkyl substituent of the alkylphenol has 6 to 20 carbon atoms.

8. The concentrate composition of claim 1 wherein the oligomeric reaction product of (C)(6) is prepared from the reaction of an alkylphenol, formaldehyde, and salicylic acid wherein the alkyl substituent of the alkylphenol has 7 to 40 carbon atoms.

9. The concentrate composition of claim 1, further comprising:
an antioxidant, a metal deactivator, or mixtures thereof.

10. A fuel composition, comprising:
a jet fuel; and
the concentrate composition of claim 1 wherein each of the compositions for components (B) and (C) is present in the fuel composition at 1-1,000 ppm by weight.

11. The fuel composition of claim 10 wherein the jet fuel is selected from the group consisting of JP-4, JP-5, JP-7, JP-8, Jet A, Jet A-1, and Jet B.

12. A method to improve the thermal stability of a jet fuel, comprising:
adding to the jet fuel a thermal-stability improving amount of the concentrate composition of claim 1.

13. A method to reduce deposits in a fuel circulation system and combustion system of a jet engine, comprising:
operating the jet engine with the fuel composition of claim 10.

14. The concentrate composition of claim 1, further comprising:

(D) a cold-flow improving composition selected from the group consisting of (8) an esterified copolymer of maleic anhydride, styrene, and optionally an alkyl methacrylate; (9) a copolymer of a dialkyl fumarate, a vinyl ester of a carboxylic acid, and optionally a vinyl alkyl ether; (10) a methacrylate polymer prepared from a mixture of alkyl methacrylate monomers; (11) a copolymer of an olefin selected from the group consisting of olefins having 2 to 12 carbon atoms and mixtures thereof, and a vinyl ester of a carboxylic acid; (12) a polymer prepared from the reaction of an alkylphenol and formaldehyde wherein the alkyl substituent of the alkylphenol has 14 to 60 carbon atoms; (13) a reaction product of a hydrocarbyl substituted acylating agent and an amine selected from the group consisting of an alkanolamine and a polyamine wherein the hydrocarbyl substituent of (D)(13) has 8 to 40 carbon atoms; and (14) mixtures thereof wherein each of the compositions for component (D) is present in the concentrate composition at 1-70 weight %.

15. The concentrate composition of claim 14 wherein the esterified copolymer of (D)(8) is further reacted with an amine.

16. The concentrate composition of claim 14 wherein the copolymer of (D)(11) is a copolymer of ethylene and vinyl acetate.

17. The concentrate composition of claim 14 wherein the polymer of (D)(12) is prepared from an alkylphenol wherein the alkyl group has 24 to 28 carbon atoms.

18. The concentrate composition of claim 14 wherein the polymer of (D)(12) is prepared from an alkylphenol wherein the alkyl group has at least 30 carbon atoms.

19. The concentrate composition of claim 14 wherein the reaction product of (D)(13) is the reaction product of an alkenylsuccinic acylating agent and alkanolamine wherein the alkenyl group has 12 to 36 carbon atoms and the alkanolamine is dimethylethanolamine or diethanolamine.

20. The concentrate composition of claim 14, further comprising:
an antioxidant, a metal deactivator, or mixtures thereof.

21. The fuel composition of claim 10 wherein the concentrate composition further comprises (D) a cold-flow improving composition selected from the group consisting of (8) an esterified copolymer of maleic anhydride, styrene, and optionally an alkyl methacrylate; (9) a copolymer of dialkyl fumarate, a vinyl ester of a carboxylic acid, and optionally a vinyl alkyl ether; (10) a methacrylate polymer prepared from a mixture of alkyl methacrylate monomers; (11) a copolymer of an olefin selected from the group consisting of olefins having 2 to 12 carbon atoms and mixtures thereof, and a vinyl ester of a carboxylic acid; (12) a polymer prepared from the reaction of an alkylphenol and formaldehyde wherein the alkyl substituent of the alkylphenol has 14 to 60 carbon atoms; (13) a reaction product of a hydrocarbyl substituted acylating agent and an amine selected from the group consisting of an alkanolamine and a polyamine wherein the hydrocarbyl substituent of (D)(13) has 8 to 40 carbon atoms; and (14) mixtures thereof wherein each of the compositions for component (D) is present in the concentrate composition at 1-70 weight % and each of the compositions is present in the fuel composition for component (D) at 1-5,000 ppm by weight.

22. The fuel composition of claim 21 wherein the jet fuel is selected from the group consisting of JP-4, JP-5, JP-7, JP-8, Jet A, Jet A-1, and Jet B.

23. The method of claim 12 wherein the concentrate composition further comprises (D) a cold-flow improving composition selected from the group consisting of (8) an esterified copolymer of maleic anhydride, styrene, and optionally an alkyl methacrylate; (9) a copolymer of dialkyl fumarate, a vinyl ester of a carboxylic acid, and optionally a vinyl alkyl ether; (10) a methacrylate polymer prepared from a mixture of alkyl methacrylate monomers; (11) a copolymer of an olefin selected from the group consisting of olefins having 2 to 12 carbon atoms and mixtures thereof, and a vinyl ester of a carboxylic acid; (12) a polymer prepared from the reaction of an alkylphenol and formaldehyde wherein the alkyl substituent of the alkylphenol has 14 to 60 carbon atoms; (13) a reaction product of a hydrocarbyl substituted acylating agent and an amine selected from the group consisting of an alkanolamine and a polyamine wherein the hydrocarbyl substituent of (D)(13) has 8 to 40 carbon atoms; and (14) mixtures thereof wherein each of the compositions for component (D) is present in the concentrate composition at 1-70 weight %.

24. The method of claim 13 wherein the concentrate composition of the fuel composition further comprises (D) a cold-flow improving composition selected from the group consisting of (8) an esterified copolymer of maleic anhydride, styrene, and optionally an alkyl methacrylate; (9) a copolymer of dialkyl fumarate, a vinyl ester of a carboxylic acid, and optionally a vinyl alkyl ether; (10) a methacrylate polymer prepared from a mixture of alkyl methacrylate monomers; (11) a copolymer of an olefin selected from the group consisting of olefins having 2 to 12 carbon atoms and mixtures thereof, and a vinyl ester of a carboxylic acid; (12) a polymer prepared from the reaction of an alkylphenol and formaldehyde wherein the alkyl substituent of the alkylphenol has 14 to 60 carbon atoms; (13) a reaction product of a hydrocarbyl substituted acylating agent and an amine selected from the group consisting of an alkanolamine and a polyamine wherein the hydrocarbyl substituent of (D)(13) has 8 to 40 carbon atoms; and (14) mixtures thereof wherein each of the compositions for component (D) is present in the concentrate composition at 1-70 weight %, and each of the compositions is present in the fuel composition for component (D) at 1-5,000 ppm by weight.